

CLAIMS

What is Claimed is:

1. A reactor for electrochemically processing a microelectronic workpiece comprising:
a movable electrode assembly disposed for movement along a motion path, the motion path including at least a portion thereof over which the electrode assembly is positioned for processing a microelectronic workpiece;
a cleaning electrode located along the motion path of a movable electrode assembly.
2. The reactor of claim 1 and further comprising a programmable controller connected to control the movable electrode assembly into the cleaning electrode during a cleaning cycle.
3. The reactor of claim 2 wherein the programmable controller connects the movable electrode assembly as an anode and the cleaning electrode as a cathode during the cleaning cycle.
4. The reactor of claim 2 wherein the cleaning electrode is disposed along a position of the motion path that is beyond the range of motion required to process a microelectronic workpiece.

5. The reactor of claim 4 wherein the programmable controller is programmed to conduct a cleaning cycle while a microelectronic workpiece is disposed in the reactor for processing.
6. The reactor of claim 4 wherein the programmable controller is programmed to execute a cleaning cycle during a workpiece processing cycle in which a microelectronic workpiece is under process.
7. The reactor of claim 1 wherein the cleaning electrode comprises platinized titanium.
8. The reactor of claim 1 wherein the movable electrode assembly comprises one or more sets of fluid delivery ports that deliver a fluid to the surface of the microelectronic workpiece.
9. The reactor of claim 8 wherein said fluid is a rinse solution.
10. The reactor of claim 8 wherein said fluid is an electrolyte.
11. The reactor of claim 8 wherein said movable electrode assembly further includes one or more sets of fluid recovery ports.

12. The reactor of claim 1 wherein said movable electrode assembly further includes one or more sets of fluid delivery ports, and one or more sets of fluid recovery ports.

13. A reactor for electrochemically processing a microelectronic workpiece, the reactor comprising:

a reactor head assembly including a workpiece contact for providing electrochemical processing power to a surface of a workpiece held by the reactor head assembly, the reactor head assembly being movable between a workpiece loading/unloading position and a workpiece processing position;

a reactor base assembly including a movable electrode assembly having an electrode surface that is movable along a plane that is generally parallel to the surface of a workpiece held by the reactor head assembly when the reactor head assembly is in the workpiece processing position; and

a gap adjustment assembly disposed on the reactor base assembly to adjust the spacing that is present between the electrode surface and the surface of the microelectronic workpiece during processing thereof.

14. The reactor of claim 13 wherein the gap adjustment assembly comprises a plurality of individually adjustable gap adjustment mechanisms.

15. The reactor of claim 14 wherein the plurality of individually adjustable gap adjustment mechanisms are disposed at generally equal intervals about a peripheral portion of the microelectronic workpiece.
16. The reactor of claim 13 wherein the gap adjustment assembly comprises a micrometer that is used to adjust the gap between the surface of the electrode of the movable electrode assembly and the surface of the microelectronic workpiece.
17. The reactor of claim 14 wherein each of the plurality of individually adjustable mechanisms comprises a micrometer that is adjustable to set the gap between the surface of the workpiece under process and the surface of the electrode of the movable electrode assembly.
18. The reactor of claim 13 wherein the reactor base assembly comprises:
a head engagement assembly including the movable electrode assembly;
a base chamber;
the head engagement assembly being compliantly mounted to the base chamber.
19. The reactor of claim 14 wherein the reactor base assembly comprises:
a head engagement assembly including the movable electrode assembly;

a base chamber;

the head engagement assembly being compliantly mounted to the base chamber.

20. The reactor of claim 15 wherein the reactor base assembly comprises:

a head engagement assembly including the movable electrode assembly;

a base chamber;

the head engagement assembly being compliantly mounted to the base chamber.

21. A reactor for electrochemically processing a microelectronic workpiece:

an electrode assembly that is connected for movement with respect to a surface of

the microelectronic workpiece that is to be processed, the electrode assembly comprising a plurality of electrodes used in electrochemically processing the surface of the microelectronic workpiece;

a control circuit connected to the electrode assembly to adjust power provided to

individual ones of the plurality of electrodes based on which of the plurality of electrodes overlaps the surface of the microelectronic workpiece at a given time as the electrode assembly is moved over the microelectronic workpiece during processing.

22. The reactor of claim 21 wherein the control circuit adjusts power to the plurality of electrodes in a binary manner.

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23. The reactor of claim 21 wherein the control circuit adjusts the power to the plurality of electrodes using multiple power levels
24. The reactor of claim 21 wherein the control circuit comprises a programmable controller.
25. The reactor of claim 21 wherein the reactor is designed to process generally circular microelectronic workpieces and wherein the plurality of electrodes are arranged in a generally rectangular shape.

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